CALIFORNIA WATER PLAN
UPDATE 2013
SUSTAINABILITY INDICATORS WORKSHOP
AUGUST 24, 2011

TOPICS FOR DISCUSSION

Definition of Water Sustainability

Sustainability can be defined in a variety of ways. Generally, the global definition relies on the idea that our consumptive use of natural systems and our activities in aquatic and terrestrial environments will allow for existing natural, social, and economic systems to flourish and for future generations to enjoy these systems in the same or better condition.

The California Water Plan, 2009 Update, included a vision statement laying the foundation for how California can be sustainable in water use and management. The vision is that: *California has healthy watersheds and integrated, reliable, and secure water resources and management systems that: Enhance public health, safety, and quality of life in all its communities; Sustain economic growth, business vitality, and agricultural productivity; and Protect and restore California's unique biological diversity, ecological values, and cultural heritage.*

We have developed a draft definition for water sustainability for discussion purposes and to guide selection of indicators to measure water sustainability: *Water use sustainability for California is the dynamic state of water use and supply in the state that meets today's needs without compromising the long-term capacity of the natural and human aspects of the water system to meet the needs of future generations.*

Topics for Discussion

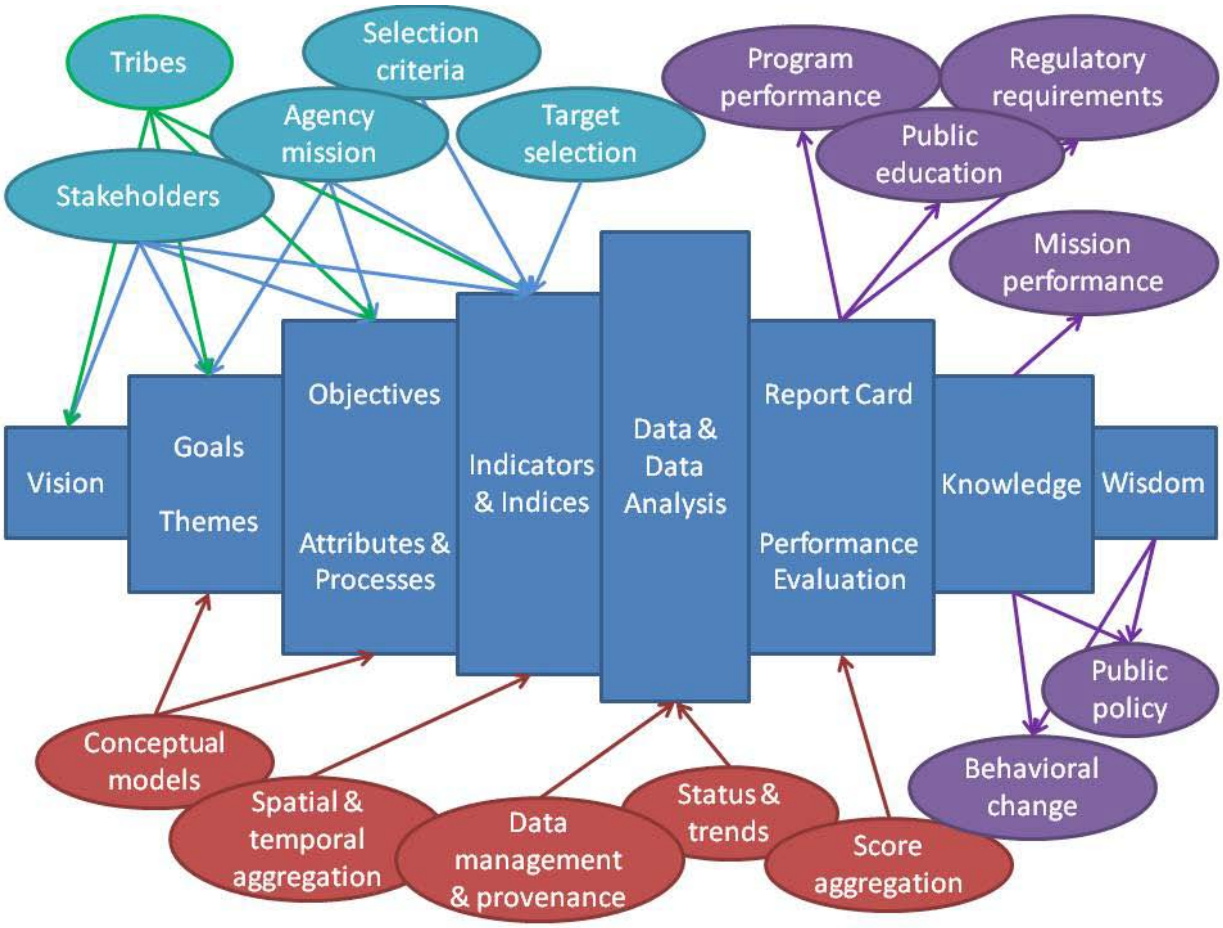
Defining Sustainability:

- What, if any, important concepts are missing from the proposed definition as it relates to water sustainability in California?

The California Water Sustainability Indicators Framework

The proposed California Water Sustainability Indicators Framework is composed of a cycle of process steps that build upon each other. The cycle begins with defining what is meant by sustainability and other terms and completes one cycle by informing policy and decision-making. The process is intended to be part of a cycle of adaptive learning and action. The framework is shown as a flowchart below, with the process flow from left to right; the diagram basically reflects the process steps.

Step 1 Describe the overall vision for sustainability and define water sustainability and related terms.
Step 2 Set goals corresponding to the vision, and measurable sustainability objectives; describe themes (e.g., water supply) and system processes.
Step 3 Select indicators corresponding to the objectives and covering all themes and processes; define targets for each indicator; describe potential causes of change in indicator condition.
Step 4 Collect data for each indicator, maintain and describe data provenance; analyze data according to distance of current state from target state and describe analytical steps; measure trend in condition and significance of trend.
Step 5 Describe summary condition and trend in condition in report card; evaluate performance of system sectors.
Step 6 Evaluate causes of condition departure from target condition and individual and programmatic actions that could maintain good conditions and repair poor conditions.
Step 7 Describe contribution of evaluation to change in knowledge, policy effectiveness, and public education



Topics for Discussion

Issues to Consider in Building the Framework:

Policy Related:

- How or are you taking into account water sustainability in your policy considerations?
- How can this Framework inform the policies that you are operating under or developing?
- How does or can the Framework relate to your day-to-day management of resources under various regulatory requirements?

Content of Steps and Framework:

- What additional steps or components should we consider for the Framework?

Water Sustainability Objectives

An important step in measuring progress toward sustainability is to describe objectives against which performance and conditions can be evaluated. In the proposed list below, the first proposed objective is an umbrella for others, intended to cover sustainability as an emergent property of the combined natural and human systems (ecosystems, communities, water management). The remaining objectives focus on particular aspects of water sustainability, including the relationship with ecosystem processes, social conditions and equity, and economic well-being. We also intend to consider sustainability of infrastructure and institutions in this process. Involved in all objectives is the overall goal of including equitable involvement in decision-making and equitable distribution of benefits and impacts from water management.

Table 1 - Proposed Sustainability Objectives

Proposed Sustainability Objectives	**Relationship to Water Plan 2009**
1. (Umbrella sustainability objective) Manage water in a manner that can be continued into the future without endangering future water availability or causing unacceptable environmental, social, or economic impacts.	Reflects overall goal of sustainability
2. Improve water use efficiency, increase water recycling, and increase water conservation in order to improve water supply reliability, reduce energy demand, and restore and maintain aquatic ecosystems and processes.	CWP Objective 2, 9; RMS Reduce demand
3. Improve regional water movement operations and efficiency and investigate new water technologies to contribute to social and ecological beneficial uses and reduce impacts associated with inter-basin water transfers.	CWP Objective 1, 2, 7, 11, RMS Operational efficiency
4. Increase conjunctive management of new and recycled water from multiple sources to increase quantity, quality, and reliability of drinking water, irrigation water, and in-stream flows.	CWP Objective 3, 12, 13; RMS Increase water supply
5. Protect and restore surface water and groundwater quality and the natural systems that maintain these services in order to safeguard human and environmental health and secure California water supplies.	CWP Objective 4; RMS on water quality; chapter 4 discussion of water quality sustainability indicators
6. Practice, promote, improve, and expand environmental stewardship to protect and enhance environmental conditions by improving watershed, floodplain, and aquatic condition and processes.	CWP Objective 5, 12, 13; RMS Natural Resources
7. Integrate flood risk management with other water and land management and restoration activities.	CWP Objective 1, 6, 12, 13; RMS Improve flood
8. Improve and expand monitoring, data management, and analysis to support decision-making, especially in light of uncertainties, that support integrated regional water management and flood and water resources management systems	CWP Objective 10; various RMSs; CWP Vol. 1 Chapter 6 Integrated Data and Analysis

Topics for Discussion

Developing Water Sustainability Objectives

- How should social and economic issues be more explicitly integrated into sustainability objectives?
- What can we add, subtract, or change about the current set of objectives?

California Water Plan Update 2013 Sustainability Indicators Workshop

August 24, 2011

Sustainability Indicators

One of the guiding principles established for decision-making in the California Water Plan Update 2009 was: "Determine values for economic, environmental, and social benefits, costs, and tradeoffs to base investment decisions on sustainability indicators."

The specific indicators chosen to measure sustainability will affect future conclusions about sustainability. Thus, the selection process and the ultimate list of indicators should be chosen using criteria that cover various issues associated with indicators. The proposed selection criteria include: 1) availability of high-quality data; 2) long-term data affordability; 3) representation of the systems of interest; 4) sensitivity to change over time; 5) independence of indicators from one another; and 6) supports management decisions and actions.

Shown below is a list of illustrative indicators, in other words they are not necessarily being recommended or final indicator choices but just a list to initiate discussion. Most of them focus on ecosystem and water supply components of sustainability. With your guidance and assistance from other stakeholders, and tribes, we would like to include more indicators that capture community well-being, health, and economic condition.

Table 2 - Examples of Candidate California Water Sustainability Indicators

Sustainability Objective	Related CWP Objective and RMS	Example Indicators	Relevance to Sustainability Objective
SO 1	Overall CWP goal of sustainability	Likelihood per year of water shortage, based upon 1) up-to-date, climate-sensitive forecasts of precipitation, evapotranspiration, and stream-flow and 2) all water uses, including environmental uses such as instream flows and social uses such as treaty-obligated water	Manage for combined natural and human uses
		Number of basins with years-long aquifer declines (known as overdraft) or projected future declines	Mange for future availability
SO 2	CWP Objective 2, 9; RMS Reduce demand	Energy required per unit of clean drinking water	Reduce energy demand for providing water
		Average water use per household,/capita, 20% reduction by 2020	Increase water conservation
		Sufficient flows and timing of flows for maintaining historically-present native aquatic fauna	Restore and maintain native ecosystems

Sustainability Objective	Related CWP Objective and RMS	Example Indicators	Relevance to Sustainability Objective
SO 3	CWP Objective 1, 2, 7, 11, RMS Operational efficiency	Distance traveled for units of drinking and irrigation water	Improve efficiency of water movement
		Infrastructure reliability	Improve water movement operations
SO 4	CWP Objective 3, 12, 13; RMS Increase water supply	Percentage of irrigated area that is in Water Stressed Are as	Increase quantity and reliability of irrigation water
		Net recharge or withdrawals	Increase conjunctive management multiple sources
SO 5	CWP Objective 4; RMS on water quality; CWP chapter 4 water quality indicators	Ratio of observed to expected native aquatic species	Protect and restore water quality for environmental health
		Surface-water Water Quality Index	Surface water quality to safeguard human and environmental health
		Groundwater Water Quality Index	Ground water quality to safeguard human health
SO 6	CWP Objective 5, 12, 13; RMS Natural Resources	Percentage of key stewardship and water conservation actions that are implemented both during and after planning	Practice environmental stewardship to enhance environmental conditions
		Proportion of streams monitored periodically	Practice environmental stewardship
SO 7	CWP Objective 1, 6, 12, 13; RMS Improve flood	Proportion of new construction with reduced paved surface and water conservation	Integrate flood risk management with water and land management
		Proportion of floodplain per reach in conservation	Integrate flood risk management with restoration
SO 8	CWP Objective 10; various RMSs; CWP Vol. 1 Chapter 6 Integrated Data and Analysis	Data sharing, standardization and distribution among disparate entities	Improve data management to support integrated regional water management
		System supports adaptation and resilience to climate change	Support decision-making in light of uncertainty

Topics for Discussion

Selecting Indicators:

- Looking at the proposed selection criteria (page 7), what, if any, additional criteria should we consider for selecting indicators?
- What, if any, particular aspects of the social and economic systems should we consider as being important for the indicators development?
- Looking at the list of the objectives and indicators (Table 1 – page 5 and Table 2 – pages 7/8), what, if any, indicators should be added or removed?